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Ottawa Hull K1A 0C9

(21) (A1) 2,147,292
(22) 1995/04/19
(43) 1996/10/20

(51) Int.Cl.[6] A61L 11/00

(19)(CA) **APPLICATION FOR CANADIAN PATENT** (12)

(54) Principle and Process for Contained Direct Disposal of Biologically Infectious Fluid Waste and Contained Aqueous Decontamination of Waste Container

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(71) Same as inventor

(57) 2 Claims

2147292

Abstract: A process for disposing of biologically infectious fluid waste directly from its container, and for decontaminating the said container without interrupting containment of the hazard at any time. This process comprises the steps of:

a. Draining the contents of a collection container for biologically infectious fluid waste materials directly to a sewage drain by means of an evacuation pump, while the collection container remains, or has been closed or sealed,

b. Flushing the interior of the container with water and or detergent while it remains closed or sealed.

The embodiments of the invention in which an exclusive property or privilege is claimed are as follows:

1 A process whereby biologically infectious fluid waste materials are evacuated directly from their post-collection environments (i.e., suction-bottle, bucket, specimen container, etc.) to a sewage drain while the said environment remains, or has been, closed or sealed; and, whereby water and/or detergent is introduced to the interior of the said environment for the purposes of flushing/decontaminating the said environment while it remains closed or sealed.

2 A process defined in claim 1 based on a new principle for biologically infectious fluid waste material management which is primary continual containment.

Specification: This invention relates to a process for handling biologically infectious fluid waste.

This process recognizes a principle I shall call primary continual containment, which has as its chief aim the elimination of occupational exposure in the handling of biologically infectious fluid waste materials. Other methods do not embody this principle. Incineration, autoclaving, secondary containment, chemical treatment, and manual disposal, all risk creating exposure hazards because more workers must transport the waste, transfer it to secondary containment, or remove it for incineration or other disposal. Because no incineration, secondary containment or other preparation is required in my process, the number of handlers is drastically reduced. Because the hazard is kept in uninterrupted containment throughout this process, occupational exposure is eliminated.
This process will be most desirable where the biologically infectious fluid waste materials are bulk blood, or fluids containing blood. Hospital operating wards will be the primary consumers of this process.

This process is simple, effective and versatile. It may be embodied in a diverse array of apparatus. The apparatus employing this process may be stationary and self-contained; it may be portable, semi-portable, or hand-held. It may serve a single container, multiple containers, or single or multiple containers in sequence. The following is a sample of the embodiments:

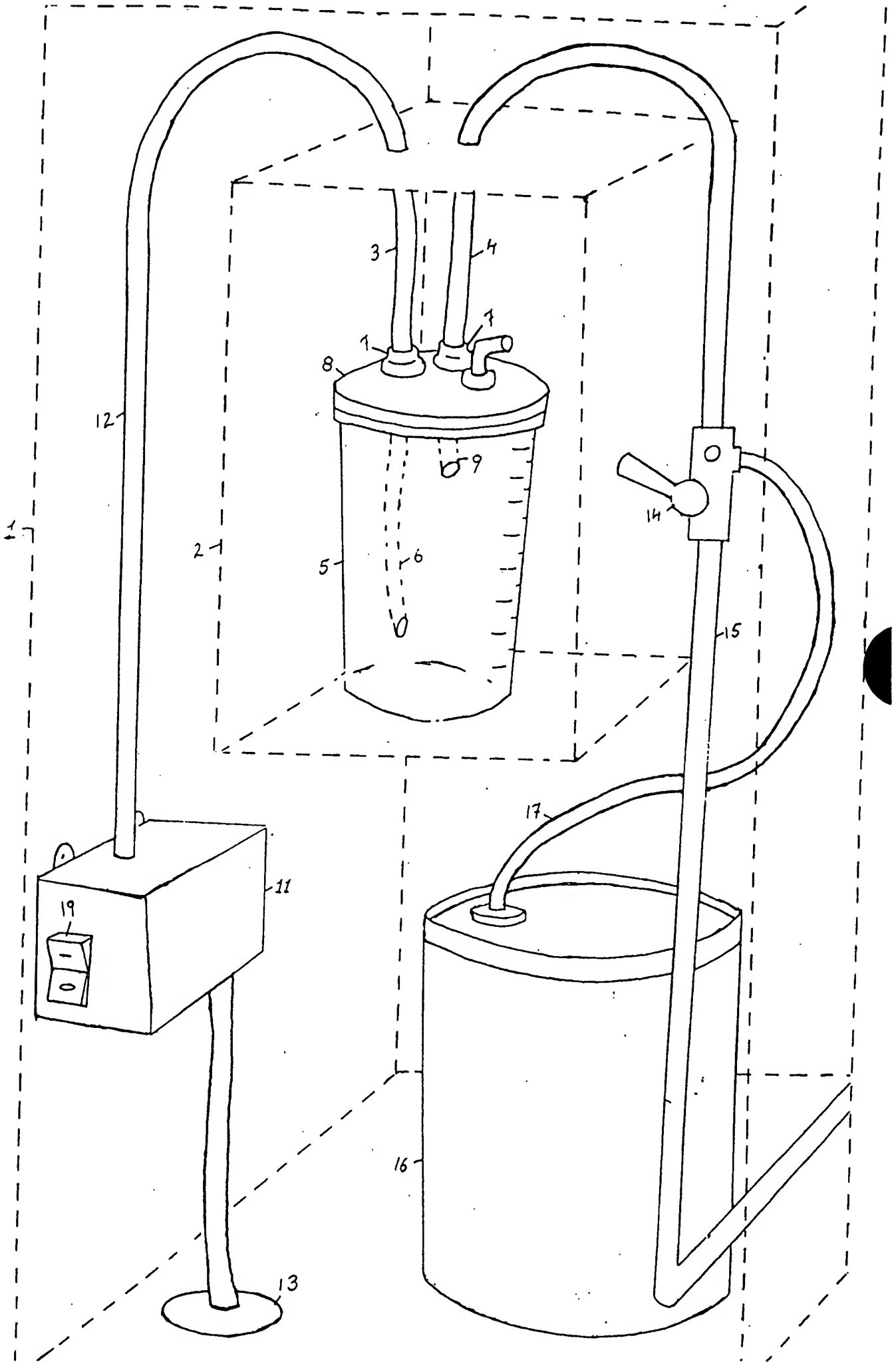
A patent was applied for the apparatus illustrated in figures **1** and **2** by myself on April 10, 1995. The process is embodied here in a device intended to be stationary in a designated area. It comprises a structural housing (1) containing a compartment (2) into which descends an output (draining) connector tubing (3), and an input (flushing) connector tubing (4). The operator of the apparatus places the suction bottle/canister (5) in the compartment (2) and inserts an output adapter (6) through a port (7) on the suction bottle lid (8), and connects the output adapter (6) to the output connector tubing. The operator then performs the same procedure for the input, inserting an input adapter (9) through a port (7) on the suction bottle lid (8). After both output and input connections are made, the operator closes and secures the compartment door (10). The suction bottle/canister (5) is now ready to be drained and flushed. Draining begins when the operator switches on the electric pump (11), creating a negative pressure in the output line (12). This causes the contents of the suction bottle/canister (5) to be drawn into the output adapter (6), through the output connector tubing (3), through the output line (12), and into a sewage drain (13). When the suction bottle/canister (5) is drained, the operator leaves the electric pump (11) running and opens the input flow control valve (14). This could be a common tap, or a more sophisticated type of regulator. Opening the flow control valve (14) allows pressurized water to flow through the water line (15). The

positive pressure created by flowing water causes germicidal detergent to be drawn from its drum (16), through the detergent connector hose (17), and into the water line (15). This mixture of water and detergent flows through the input connector tubing (4), through the input adapter (9), and in to the suction bottle/canister (5). The flushing sequence may be repeated as many times as necessary. When flushing is complete, the input flow control valve (14) is closed. Once the remaining water and detergent are drained from the suction bottle/canister (5), the electric pump (11) is switched off. The operator may then open the compartment door (10), disconnect the output/input connector tubings (3 and 4) from the output/input adapters (6 and 9) and remove the suction bottle/canister (5) from the compartment (2). The suction bottle/canister (5) can then be sent for processing and sterilizing.

The embodiment of this process depicted in figures **3** and **4** is a hand-apparatus (1) which has a pistol-grip (2) and a trigger mechanism (3). The operator of this apparatus opens a suction bottle lid port (4) and inserts an input adapter (5) and an output adapter (6), which are then fixed to the lid ports and connected to the input (7) and output (8) connectors. The vacuum or pumping mechanism is engaged and the suction bottle is allowed to drain. When the waste fluids are removed, the operator depresses the trigger, opening a valve (9) similar in operation to a garden hose, allowing water and detergent to flow into the closed bottle. The sequence of draining and flushing is repeated as required. When complete, the operator detaches the input/output connectors, leaving the adapters inside the bottle and still connected to the lid ports. The decontaminated bottle and attendant adapters is sent to central processing for sterilization. The adapters will also be processed and returned. A number of adapters will be kept in circulation.

The embodiment of this process depicted in figures **5** and **6** is a portable apparatus designed specifically for a waste collection container which is open and requires sealing. During some surgical procedures, fluids are drained gravitationally rather than by suction. An example of this is knee surgery, where synovial fluid is collected in an open container commonly referred to as a "kick bucket." Often, a large amount of fluid is present, making transportation and disposal more problematic. This apparatus is transported to the location of the kick bucket (1) (the O.R. theatre). The apparatus is hooked up to power (2), water (3) and sewage (4). A fitted dome lid (5) is placed over the bucket mouth and secured by fasteners (6). The dome lid contains an output adapter (7) and an input adapter (8). The input adapter is a spray head located at the dome's centre which faces down into the bucket when the dome is affixed. The principle of primary continual containment can now be executed with this apparatus as with the others. The fluid waste is evacuated from the bucket, and the interior of the bucket is flushed with water and detergent, which is also evacuated away. The embodiment is depicted as a transportable system with a trolley (9), in which is housed a pump (10), germicidal detergent (11) and stowage space for the dome lid, attachments and accessories.

This process is embodied in miniature in figures 6 and 7. Scaled-down and automated, this principle and process could be employed in laboratories, particularly where viruses and other pathogens are intentionally concentrated (test tubes and beakers are of course not the most suitable containers for this process; the illustrations are intended only to demonstrate the application). Presently, many laboratories collect fluid waste in secondary containers, or autoclave fluid waste. Autoclaving often fails, particularly if the load is dense. Wastes transported from the lab present hazards for other workers along the way to final disposal.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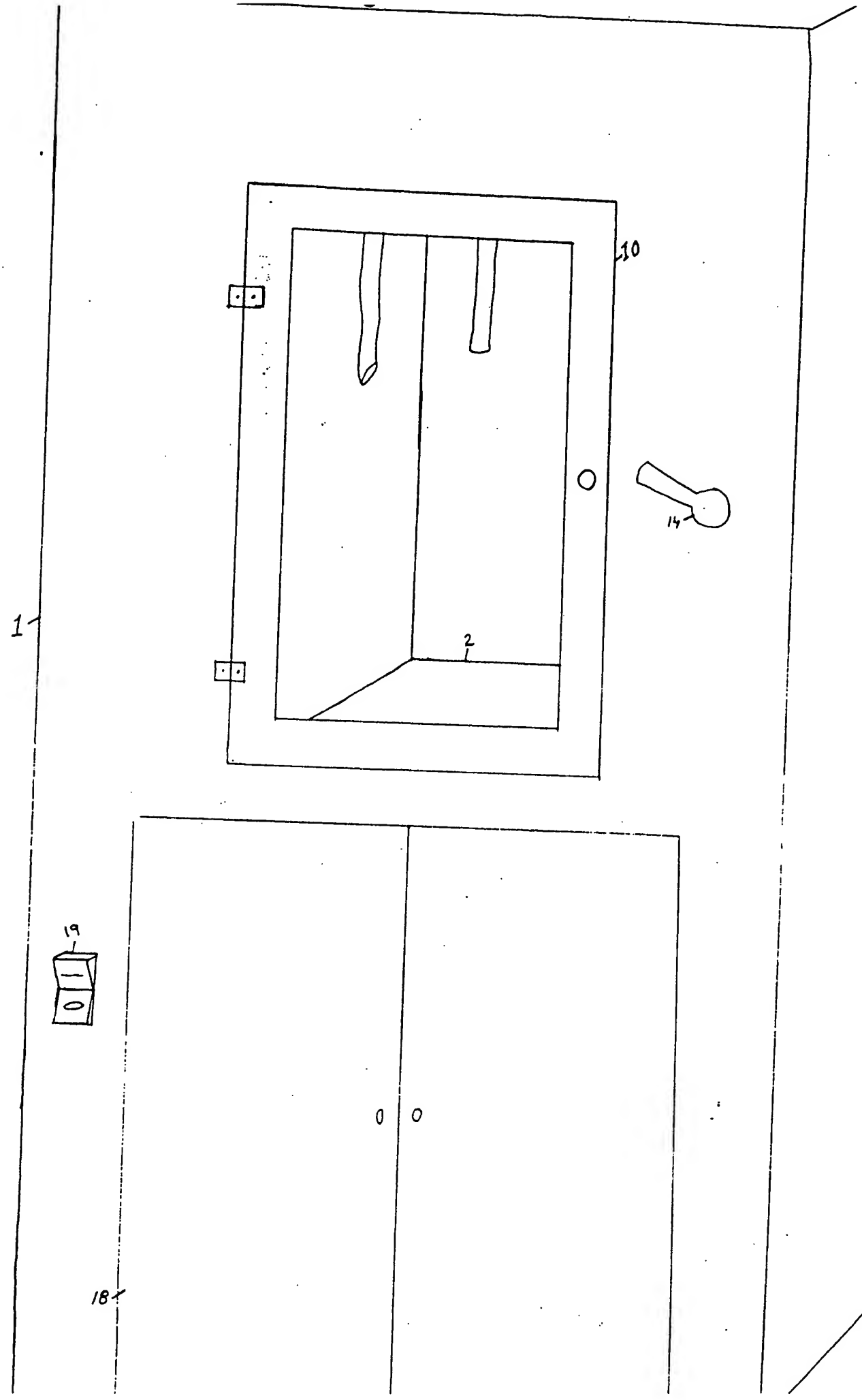
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Fig 3.

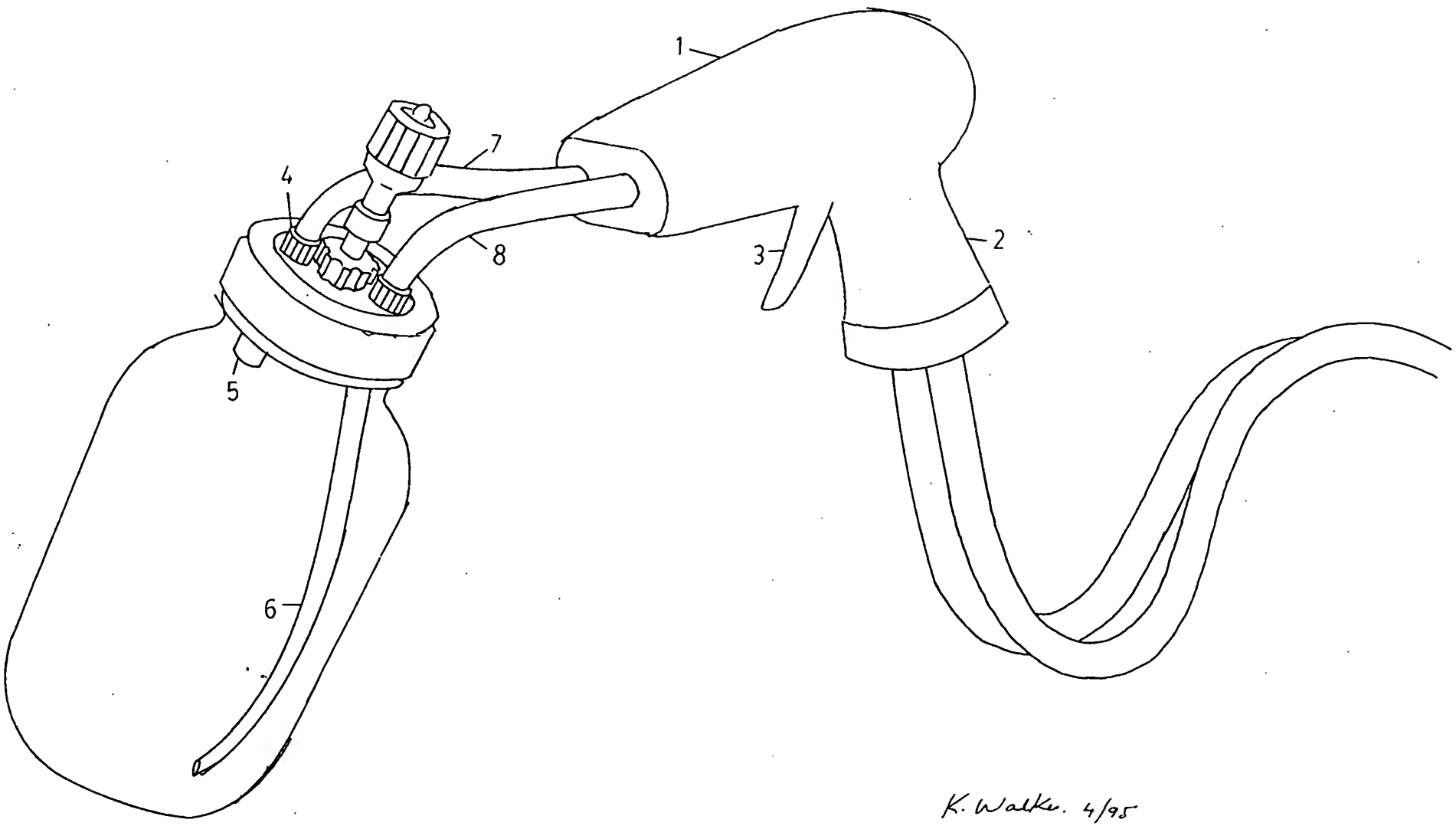

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Fig 4.

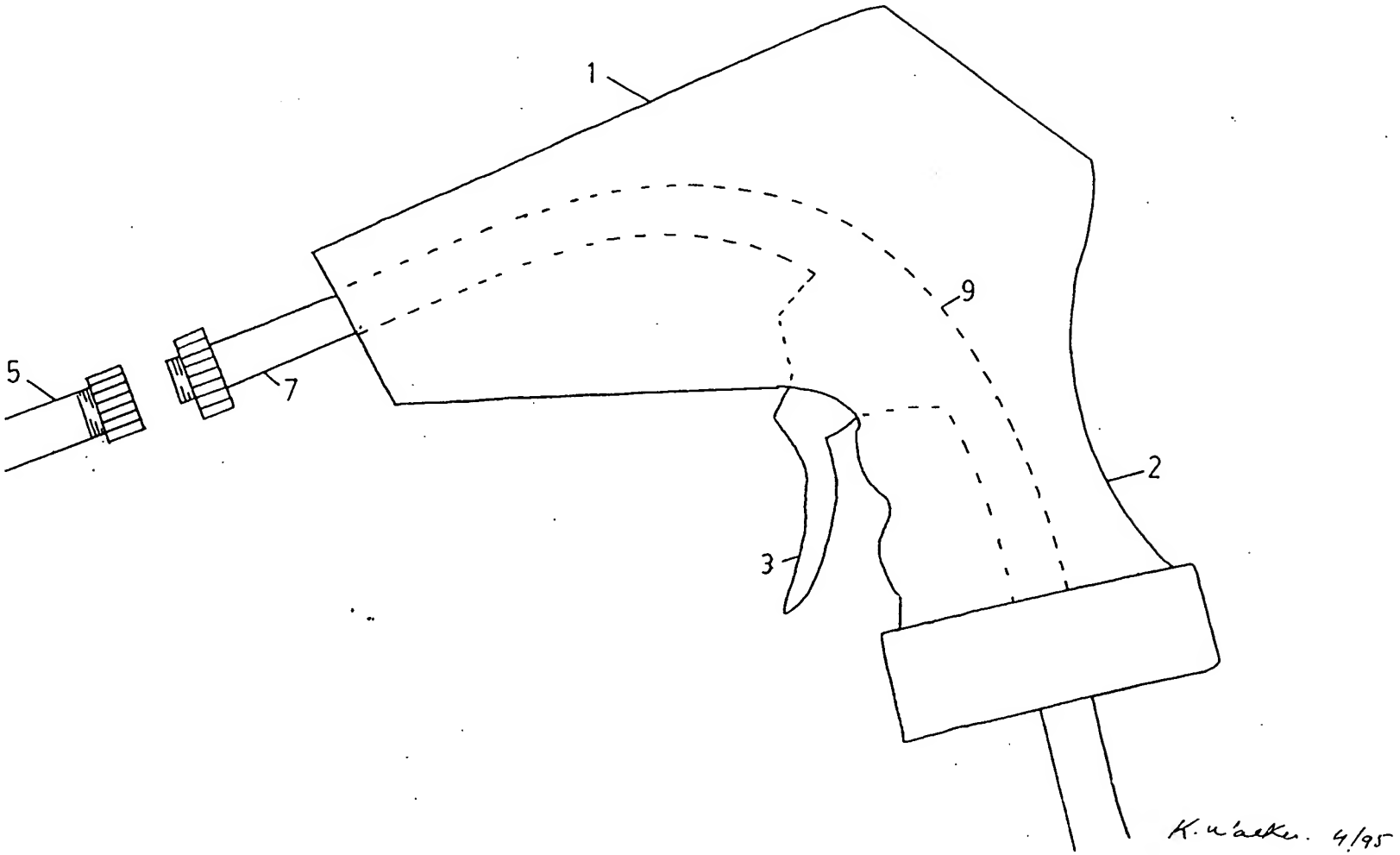

Fig 5.

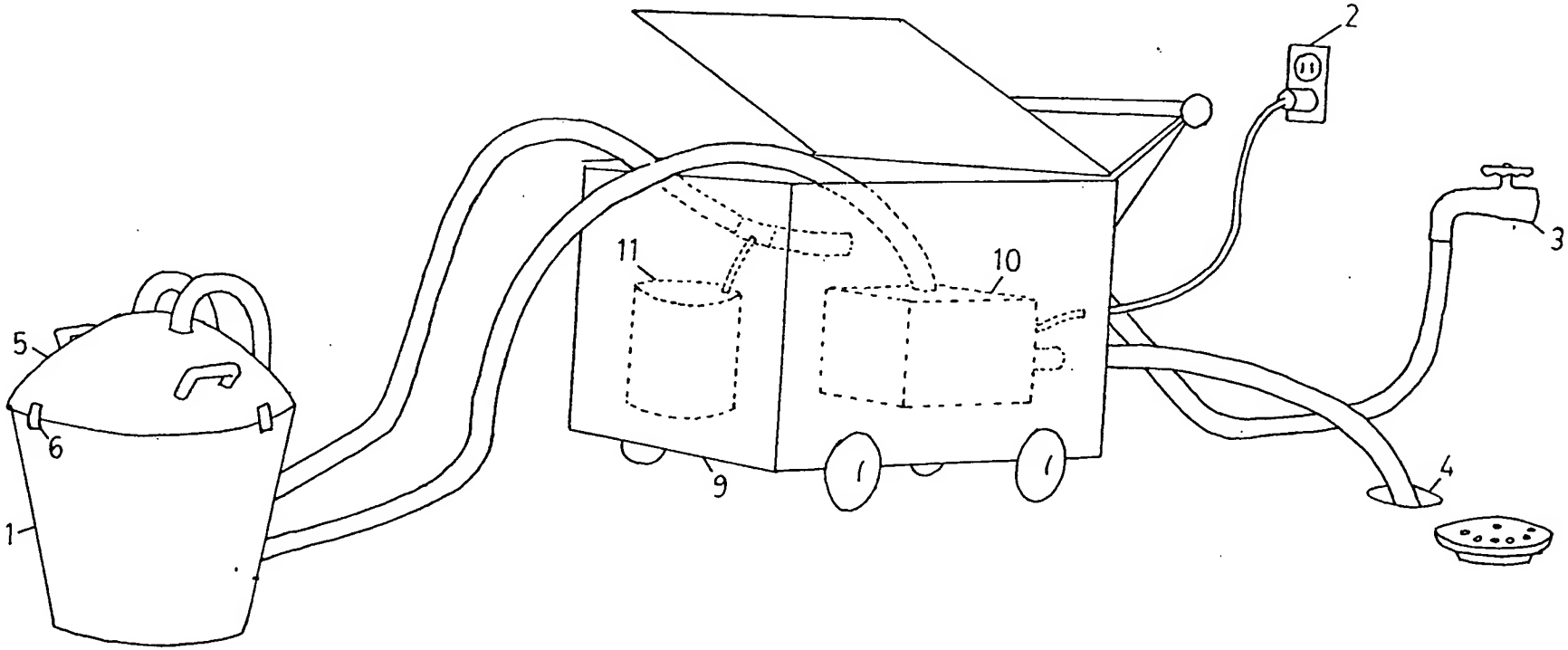

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Fig 6.

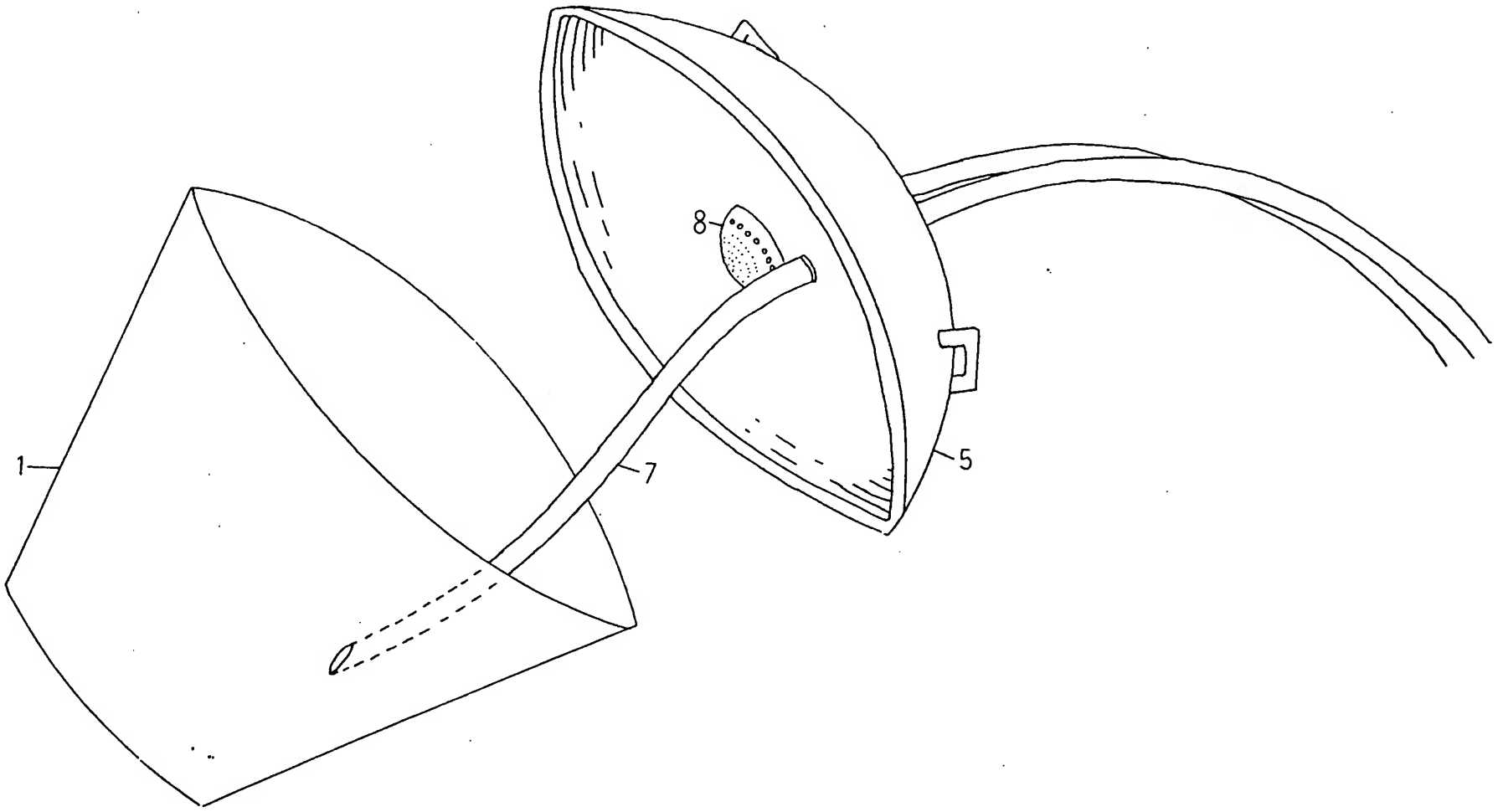

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Fig 7.

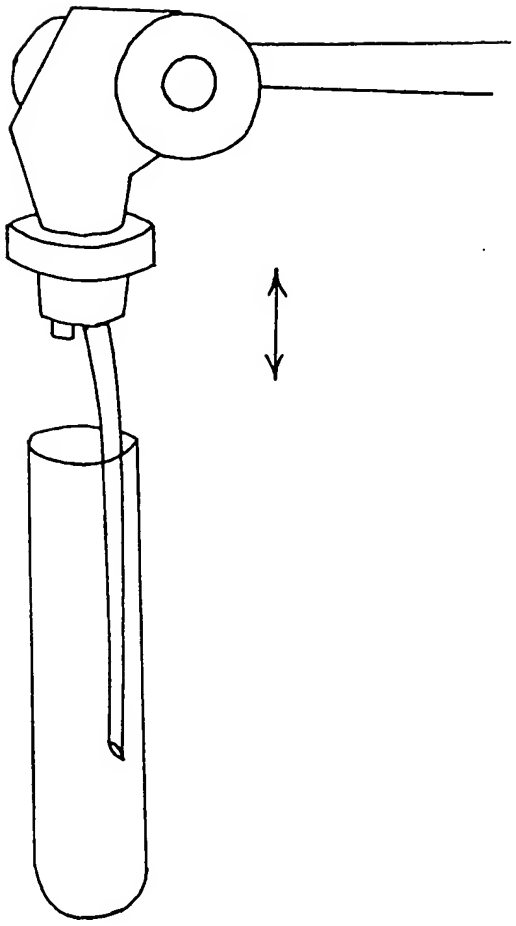

Fig 8.